

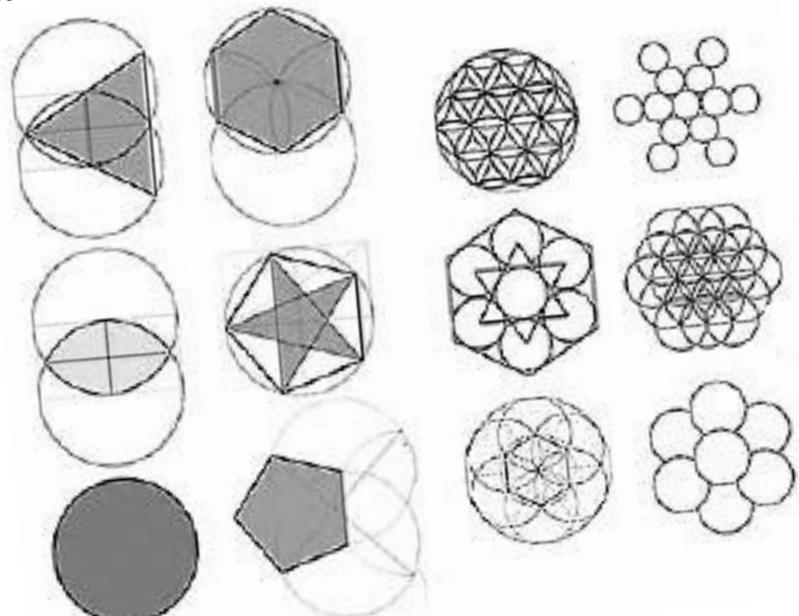
Mathematics Scrapbook

with Helen Prochazka

Sacred geometry

At first geometry was a practical subject to be used in the physical world. Then it took on another role as a system of thought and it became geometry for the mind. Now we will learn something of its third role. Geometry for the spirit.

For Pythagoras, the soul was mathematical. Its home was a divine realm beyond the physical where it would return after physical death. The study of mathematics was an essential part of spiritual practice because mathematics had the power to free the soul from the shackles of the body. This heavenly world was based on the shapes of sacred geometry. Shapes that also served as the archetypes for the physical world. Sacred geometry incorporates both spiritual and philosophical beliefs. A large proportion of the world's spiritual art and architecture have designs that are based on sacred geometry principles. Great cathedrals, ancient temples and even a small sanctuary built by the current Prince of Wales. These sacred shapes also abound in advertising and corporate logos. Their messages bypass the conscious mind. The circle draws the viewer into its centre and concentrates their attention. The triangle is a visually arresting shape implying stability and strength. Perhaps these shapes please our senses because they are part of our inner being.



Show your working

In the margin of his copy of Diophantus' *Arithmetica*, Fermat wrote:

To divide a cube into two other cubes, a fourth power or in general any power whatever into two powers of the same denomination above the second is impossible, and I have assuredly found an admirable proof of this, but the margin is too narrow to contain it.

A Chinese proverb

The infinite is a square without corners.

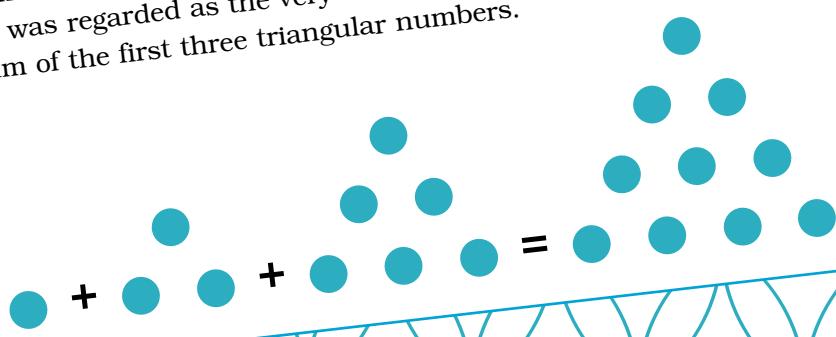
Feminine and perfect

For the Pythagoreans, numbers did not only have geometrical properties, but also personalities. The even numbers were feminine and the odd numbers, except for 1, were masculine. The number for marriage was 5 as:

$$\text{first feminine number} + \text{first masculine number} = 2 + 3 = 5$$

There were perfect numbers. There were defective numbers and amicable numbers; but the best numbers were the triangular numbers.

10 was regarded as the very best number of all as it was the sum of the first three triangular numbers.



An Apache theorem

An Indian chief had three wives who were preparing to give birth — one on a buffalo hide, the second on a bear hide and the third on a hippopotamus hide. In due course the first wife had a boy, the second had a girl and the third had twins — a boy and a girl. This was a demonstration of the well known theorem:

The squaw on the hippopotamus is equal to the sum of the squaws on the other two hides.

Beauty in numbers

Why are numbers beautiful?
It's like asking why is Beethoven's Ninth Symphony beautiful. If you don't see why, someone can't tell you. I know numbers are beautiful. If they aren't beautiful, nothing is.
Paul Erdős

Maths in old age

Old mathematicians never die; they just lose some of their functions.

Da Vinci's tree formula

Leonardo da Vinci recognised the spreading effect in trees and formulated this mathematical law:

The sum of the thicknesses of all twigs and branches of a tree cut by a circle of given radius, is equal to the thickness of the tree trunk.

